

1988 CONTENTS

January/February

ARTIFICIAL INTELLIGENCE

The Emergence of Artificial Intelligence Technology	2
Ronald J. Brachman and Fran H. Henig	
The Basics of Knowledge Representation and Reasoning	7
Ronald J. Brachman	
Planning and Plan Recognition	25
Henry A. Kautz and Edwin P. D. Pednault	
Natural Language Processing	41
Julia Hirschberg, Bruce W. Ballard, and Donald Hindle	
Electronic Neural Networks	58
Richard E. Howard, Lawrence D. Jackel, and Hans P. Graf	
Programming Connectionist Architectures	65
Mark A. Jones	
Rule-Based Programming in the UNIX System	69
Gregg T. Vesonder	
The VLSI Design Automation Assistant: A Synthesis Expert	81
Thaddeus J. Kowalski	
Expert Systems for AT&T Switched Network Maintenance	93
Paul H. Callahan	
Knowledge-Based Signal Interpretation	104
Sylvia D. Kuzmak, Mark D. Brittingham, Allen L. Gorin, Gregory A. Milich, and Joseph E. Shoenfelt	

March/April

ROBOTICS TECHNOLOGIES

Robotics Technologies—A Key Element in Achieving Manufacturing Excellence	2
Melvin I. Cohen and Richard L. Campbell	

1988 CONTENTS

January/February

ARTIFICIAL INTELLIGENCE

The Emergence of Artificial Intelligence Technology	2
Ronald J. Brachman and Fran H. Henig	
The Basics of Knowledge Representation and Reasoning	7
Ronald J. Brachman	
Planning and Plan Recognition	25
Henry A. Kautz and Edwin P. D. Pednault	
Natural Language Processing	41
Julia Hirschberg, Bruce W. Ballard, and Donald Hindle	
Electronic Neural Networks	58
Richard E. Howard, Lawrence D. Jackel, and Hans P. Graf	
Programming Connectionist Architectures	65
Mark A. Jones	
Rule-Based Programming in the UNIX System	69
Gregg T. Vesonder	
The VLSI Design Automation Assistant: A Synthesis Expert	81
Thaddeus J. Kowalski	
Expert Systems for AT&T Switched Network Maintenance	93
Paul H. Callahan	
Knowledge-Based Signal Interpretation	104
Sylvia D. Kuzmak, Mark D. Brittingham, Allen L. Gorin, Gregory A. Milich, and Joseph E. Shoenfelt	

March/April

ROBOTICS TECHNOLOGIES

Robotics Technologies—A Key Element in Achieving Manufacturing Excellence	2
Melvin I. Cohen and Richard L. Campbell	

A Flexible Manufacturing Workstation Peter F. Lilienthal II, J. Peter Flemming, E. G. Harokopos, and Glenn C. Van Orden	5
Design of a Robotic Workstation for Component Insertion Linda S. Decelle	15
Technology for Robotic Mechanical Assembly: Force-Directed Insertions David R. Strip	23
Machine-Vision-Assisted Workstation for Lightwave Device Manufacture Donald A. Berk, Frank F. Judd, and Stanley C. Wisniewski II	35
Automated Visual Inspection of Solder Bumps Rajarshi Ray	47
Real-Time Software for Robotics Ingemar J. Cox, David A. Kapilow, Walt J. Kropfl, and Jonathan E. Shopiro	61
Building Fast, Intelligent Robot Systems Russell L. Andersson	73
Automating Manual Storeroom Zones in a Factory B. Mustafa Pulat and Alan P. W. Hewett	87
CEST: An Expert System Function Library and Workbench for UNIX System/C Language William B. Frakes and Christopher J. Fox	95

May/June

SECURE DATA SYSTEMS

Information Security: An Overview Alf L. Andreassen, William J. Leighton, and David F. Schreiber	2
Security Standards—Government and Commercial L. Kirk Barker and Larry D. Nelson	9
The Secure Data Network System Bennett C. Karp, L. Kirk Barker, and Larry D. Nelson	19
A Security Methodology for Computer Networks Lyndon G. Pierson and Edward L. Witzke	28
Sandia's Terminal Switching Network and Fiber Optic Loop Lawrence F. Tolendino, Spencer D. Nelson, and Steven A. Gossage	37

Design of a Certifiable One-Way Data-Flow Device	44
Ronald L. Sharp	
System V/MLS Labeling and Mandatory Policy Alternatives	53
Charles W. Flink II and Jonathan D. Weiss	
Quest—A Security Auditing Tool	65
Sharon A. Kapilow and Mikhail Cherepov	

July/August

SOFTWARE PRODUCTIVITY

A Discipline for Improving Software Productivity	2
Robert M. Factor and William B. Smith	
Software Estimation Technology	10
Wilfred E. Lehder, Jr., D. Paul Smith, and Weider D. Yu	
C++: Evolving Toward a More Powerful Language	19
James O. Coplien, Stephen C. Dewhurst, and Andrew R. Koenig	
Software Specification and Prototyping Technologies	33
Donald W. Brown, Christopher D. Carson, Warren A. Montgomery, and Paul M. Zislis	
Tools for Building Application Generators	46
J. Craig Cleaveland and Chandra M. R. Kintala	
Product Administration Through SABLE and NMAKE	59
Steve Cichinski and Glenn S. Fowler	
Reuse of Software Modules	71
Kathryn J. Anderson, Roger P. Beck, and Thomas E. Buonanno	
Some Research Directions for Large-Scale Software Development	77
David G. Belanger, G. David Bergland, and Mike Wish	

September/October

PERFORMANCE MODELING AND ANALYSIS

An Introduction to Performance Modeling and Analysis	2
Albert A. Fredericks and Jack M. Holtzman	

A Transient Analysis of a Data Network with a Processor-Sharing Switch	4
Alan A. Weiss and Debasis Mitra	
The Effect of Bandwidth Management on the Performance of a Window-Based Flow Control	17
Daniel T. Luan and David M. Lucantoni	
SNA/SDLC Performance over ISDN Frame-Relay, Virtual-Circuit Data Networks	27
Anurag Kumar	
Performance Models of Binary Synchronous Communications Multipoint Circuits over Virtual Private-Line Frame Relay Networks	41
Robert G. Cole	
Performance Evaluation of Variable-Bit-Rate Voice in Integrated Packet Networks	57
V. R. Karanam, K. Sriram, and Duane O. Bowker	
Dynamic Load Balancing Through Process and Read-Site Placement in a Distributed System	72
Anna Hac and Theodore J. Johnson	
An Analytical Model for UNIX Systems	86
Gopalakrishnan Ramamurthy	
A Performance Study of the UNIX System V Fork System Call Using Casper	100
Ronald E. Barkley and Curt F. Schimmel	
Performance Analysis of System 75	110
Robert H. Astmann and Joseph S. Kaufman	

November/December

DATA NETWORKING

Data Networking: An Issue Overview	3
Richard D. Gitlin and James C. Kaufeld, Jr.	
Data Networking Directions	7
William L. Gewirtz and Peter H. Stuntebeck	
AT&T Data Networking Architecture	23
Kwame A. Boakye, James C. Kaufeld, Jr., and John W. Palmer	
Congestion Control in ISDN Frame-Relay Networks	35
Bharat T. Doshi and Han Q. Nguyen	

Virtual Private-Line Performance and Customer Cost Impacts Diane D. Sheng	47
Priority Statistical Multiplexer Design for SNA*/SDLC Access to a Virtual-Circuit Packet Network Jin-Der Wang and Ender Ayanoglu	69
Design of the Bank of America California Data Network Muayyad Al-Chalabi and William J. Liss	87
ISDN Data Networking Applications in the Corporate Environment John P. Delatore, Patrick Krause, and Randall J. Wilson	107
Unified Network Management from AT&T Roberta S. Cohen, Hsin K. Kan, and Raymond J. Pennotti	121
StarKeeper Network Troubleshooter: An Expert System Product Todd E. Marques	137
Synthesis of High-Quality Ultra-Thin Gate Oxides for ULSI Applications Pradip K. Roy and Ashok K. Sinha	155

